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(54) ACCESSORY DEVICE FOR A MEDIUM VOLTAGE CONTACTOR

(57) An accessory device for a Medium Voltage contactor, comprises a latching element 2 movable along an insertion/withdrawal direction between a first operating position in which a movable contact of the contactor is latched and a second resting position in which the movable contact is released. The latching element 2 is provided with means 3 for reducing friction comprising a first 31 and a second roller 32, a supporting structure 21 for the first and second rollers, and a first 41 and a second 42 pin housed in the supporting structure 21 onto which the first 31 and second 32 rollers are respectively mounted free to rotate around their longitudinal axis. First retaining means 5 lock the first and second pins along the direction of the longitudinal axis, and second retaining means 6 block the rotation of the first and second pin with respect to the supporting structure 21.

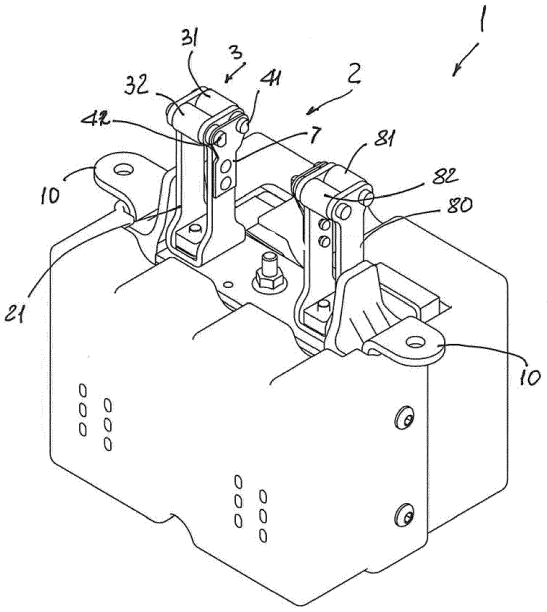

Fig.1

EP 3 748 661 A1

Description

[0001] The present invention relates to an accessory device for a Medium Voltage contactor (e.g. a vacuum contactor), in particular to a mechanical latching accessory device for an electrically latched Medium Voltage contactor.

[0002] For the purpose of the present application, the term "medium voltage" (MV) relates to operating voltages at electric power distribution levels, which are higher than 1 kV AC and 1.5 kV DC up to some tens of kV, e.g. up to 72 kV AC and 100 kV DC.

[0003] As is known, MV electric systems typically adopt two different kinds of switching devices. A first type of switching devices, including for example circuit breakers, is basically designed for protection purposes, namely for carrying (for a specified time interval) and breaking currents under specified abnormal circuit conditions, e.g. under short circuit conditions.

[0004] A second type of switching devices, including for example contactors, is basically designed for manoeuvring purposes, namely for carrying and breaking currents under normal circuit conditions including overload conditions.

[0005] Among the MV contactors, MV vacuum contactors represent a widely used type of contactors. These apparatuses are suitable for installation in harsh environments (such as in industrial and marine plants) and are typically used in control and protection of motors, transformers, power factor correction banks, switching systems, and the like.

[0006] Normally, a MV vacuum contactor comprises, for each electric pole, a vacuum bulb in which the electrical contacts are placed to mutually couple/decouple upon actuation by a suitable actuating device.

[0007] Some MV vacuum contactors of the state of the art (bi-stable contactors) adopt an electromagnetic actuator to move the movable contacts from an open position to a closed position with respect to the fixed contacts (closing manoeuvre of the contactor), and from a closed position to an open position with respect to the fixed contacts (opening manoeuvre of the contactor).

[0008] Other MV vacuum contactors of the state of the art (mono-stable contactors) adopt an electromagnetic actuator to move the movable contacts from an open position to a closed position with respect to the fixed contacts (closing manoeuvre of the contactor) and to hold the movable contacts in said closed position (closing state of the contactor). Differently from bi-stable contactors, these apparatuses comprise opening springs to move the movable contacts from a closed position to an open position with respect to the fixed contacts (opening manoeuvre of the contactor).

[0009] In most cases, the MV contactors market requires the contactor being provided with an electrically latched electromagnetic actuation, typically comprising a closing coil, an electrical holding function, and a tripping spring. However, a considerable number of applications require a dedicated version with a latching function in closed position, typically comprising a closing coil, a mechanical latching/holding in closed position system, and a tripping coil.

[0010] Electrically and mechanically latched contactors target different applications and different market segments due to different functional features.

[0011] In particular, an electrical latching system has an active coil-driven closing command and a passive spring-driven tripping command, and the closed position is maintained by means of a holding current with consequent power consumption in holding. In practice, an electrical latch has one stable position of rest (i.e., the open position) and the opening operation has highest priority (i.e., the spring-driven actuator trips the device in case of loss of auxiliary power). Conversely, a mechanical latch has an active coil-driven closing command and an active coil-driven tripping command, and the closed position is maintained by a latch that can be, e.g., mechanical or permanent magnet based, and consequently there is no power consumption in holding. In practice, a mechanical latch has two stable positions of rest (i.e., both open and closed position) and the holding of present position has highest priority (i.e. the device avoids transitions and keeps the present position in case of loss of auxiliary power).

[0012] From a production standpoint, for most of the existing MV vacuum contactors on the market the electrically and mechanically latched versions of the contactors are differentiated by implementing during the production process in the factory dedicated different versions of the product.

[0013] In both cases the change between electrical and mechanical latching system must be implemented by the manufacturer during the production phase and not by the customer or onsite during the commissioning phase. This is in strike contrast with the technological and market trends in MV apparatuses and systems, since nowadays the market is moving towards basic product platforms that can be customized by means of optional accessory kits, in order to allow better production flexibility the selling of the product via distributors.

[0014] To this purpose, mechanical latching accessory kits have been recently developed that allow customizing the contactor, in an electrically or mechanically latched version, according to the needs on the customer site. In practice, with this system, the mechanical latch is an accessorized version of a basic electrically-latched platform that can be used as is or transformed in a mechanically latched version with the simple operation of assembling the accessory kit, e.g., on the front side of the contactor.

[0015] From a construction and functional standpoint, in order to latch the mechanical link of the Medium Voltage contactor, the latching element is inserted in a space between the mechanical link and another part of the Medium Voltage contactor so as to create mechanical interference and lock the mechanical link of the Medium Voltage. When the unlatching operation is carried out, the

latching element is withdrawn from said space and brought back to its resting position, thereby allowing to execute the required movement of the mechanical link of the Medium Voltage contactor.

[0016] One of the major problems of the mechanical latching systems of know type is given by the strong requirements of mechanical endurance certification (250k operating cycles) that the system must be able to withstand.

[0017] In view of the possible frictions of the latching element with the mechanical link and/or other parts of said Medium Voltage contactor, the latching element is normally provided with means for reducing the friction with the mechanical link and/or other parts of said Medium Voltage contactor, for instance one or more roller bearings.

[0018] However, due to the high number operating cycles, the relatively high friction forces (and the consequent wearing of the components of the latching element) and the relatively small dimensions of the latching element, none of the systems available so far has been fully satisfactory in terms of reliability.

[0019] Indeed, in case of latching element provided with roller bearings as means for reducing the friction, the wearing induced on the pins by the rotation of the rollers during insertion/withdrawal of the latching element normally brings about mechanical failure of system after a relatively low number of operating cycles. In practice, is has been seen that a very critical point for the reliability of the latching system is given by the roller bearing fixing system, where the pins, on which are mounted the roller bearings, have to satisfy strong requirements of surface hardness and overall dimension of fixing system.

[0020] The main aim of the present invention is to provide an accessory device for a Medium Voltage contactor, in particular a latching device for a Medium Voltage contactor, that allows solving or at least reducing the above-mentioned problems.

[0021] More in particular, it is an object of the present invention to provide an accessory device for a Medium Voltage contactor, in particular a latching device for a Medium Voltage contactor, that is able to withstand the high number of operating cycles required for mechanical endurance certification (250k cycles).

[0022] Still another object of the present invention is to provide an accessory device for a Medium Voltage contactor, in particular a latching device for a Medium Voltage contactor, that can be easily manufactured at industrial level, at competitive costs with respect to the solutions of the state of the art.

[0023] A Medium Voltage contactor, in particular a Medium Voltage vacuum contactor, provided with a reliable latching system is also an object of the present invention.

[0024] In order to fulfill these objects, the present invention provides an accessory device for a Medium Voltage contactor, in particular a latching device for a Medium Voltage vacuum contactor, said Medium Voltage contactor comprising one or more movable contacts connected through a mechanical link to a contact actuator moving said one or more movable contacts between a contact open position and a contact closed position, the accessory device comprising: a supporting interface adapted to be fixed to and removed from said Medium Voltage contactor; a latching element movable between a first operating position and a second resting position along an insertion/withdrawal direction; a latching actuating system moving said latching element between said first, operating, position and said second, resting, position; said latching element being adapted, when it is in said first operating position, to cooperate with the mechanical link of said Medium Voltage contactor to latch said one or more movable contacts, and, when it is in said second resting position, to release said one or more movable contacts, said latching element being provided with means for reducing the friction with the mechanical link and/or other parts of said Medium Voltage contactor.

[0025] The accessory device of the present invention is characterized in that said means for reducing the friction comprise a first and a second roller and in that said latching element comprises: a supporting structure for said first and second roller; a first and a second pin housed in said supporting structure onto which said first and second roller are respectively mounted free to rotate around a longitudinal axis of said first and second pin; first retaining means locking said first and second pins along the direction of said longitudinal axis; and second retaining means blocking the rotation of said first and second pin with respect to said supporting structure.

[0026] In this way, it is possible to provide a Medium Voltage contactor, particularly a Medium Voltage vacuum contactor, with an accessory device, in particular a latching device, which is capable to withstand the high number of operating cycles required for mechanical endurance certification.

[0027] In practice, in the system of the present invention, the high reliability of the pins fixing system and the assembly easiness, makes this new unconventional latching system an essential improvement to pass the strong requirements of mechanical endurance certification.

[0028] In particular, as better explained hereinafter, the new latching system, and more in particular, the new fixing system of the pins have two main functions and effects.

[0029] The first effect allows keeping the pins locked on the longitudinal axis in a more sure and strong way, compared to any other standard solution, as the little dimensions of the pins and the strong forces working on them make not reliability any other standard solution (nuts, retaining ring, safety clip).

[0030] The second effects allows keeping the pins locked in their housing without any rotation around the longitudinal axis, thereby avoiding wearing out the metal sheet where they are mounted.

[0031] Also in this case, all the other standard solutions, allow the pins rotation wearing out the sheet metal

housing.

[0032] In a largely preferred embodiment of the accessory device for a Medium Voltage contactor of the present invention, said first and second pins are made of case-hardened steel. In practice the combination of the material and the presence of the first and second retaining means in the latching element allow achieving a very high reliability of the latching device and the required mechanical endurance.

[0033] Typically, the longitudinal axis of said first and second pins are parallel to each other and perpendicular to insertion/withdrawal direction of the latching element.

[0034] Preferably, the first retaining means in the latching element comprise first and second locking means respectively locking said first and second pins along opposite directions of said longitudinal axis. In other words, the first and second locking elements keep the first and second pins fixed and avoid any longitudinal displacement thereof with respect to the supporting structure

[0035] In an embodiment of the accessory device for a Medium Voltage contactor of the present invention, said latching element comprises a locking plate which is fixed on said supporting structure.

[0036] In particular, in such embodiment, said locking plate comprises a first and a second seat, e.g. a first and a second through hole, for said first and second pins. Then, preferably, said first and second pins have respectively a first and second non-circular shaped end which are inserted into and mate with said first and second seat.

[0037] In this way, any rotation of the first and second pin around their longitudinal axis is avoided due to the mechanical interference between the first and second non-circular shaped end of the pins and the corresponding first and second seat. In practice, according to this embodiment, the second retaining means which block the rotation of the first and second pin with respect to said supporting structure are formed by the shaped ends of the first and second pins and by the first and second seats in the locking plate.

[0038] In an embodiment of the accessory device for a Medium Voltage contactor of the present invention, said first and second pins respectively comprise a first and a second raised portion. As the pins have a substantially circular section (i.e. cylindrical shape), the respective raised portions are conveniently formed by a cylindrical portion of the pins in which the radius of the section is larger than the radius in the other part of the pins.

[0039] In a largely preferred embodiment of the accessory device for a Medium Voltage contactor of the present invention, said first and a second raised portions are adjacent to said first and second non-circular shaped end.

[0040] Moreover, in a further particularly preferred embodiment of the present invention, each of said first and a second raised portions has a face resting on said supporting structure and a further face resting on said locking plate. In this way, as better explained hereinafter, any displacement of the first and second pins with respect to said supporting structure along the direction of said longitudinal axis is avoided by the raised portions of the pins which are blocked between the supporting structure and the locking plate.

[0041] In practice, according to this embodiment, the first retaining means which lock said first and second pins along the direction of said longitudinal axis are formed by the raised portions of the pins resting on and blocked between the supporting structure and the locking plate of the latching element.

[0042] In a largely preferred embodiment of the accessory device for a Medium Voltage contactor of the present invention, the supporting structure in the latching element is U-shaped and has a central base which is fixed on the latching element and a first and a second lateral arms which protrude from opposite sides of said base. Then, housing holes are conveniently provided on said lateral arms in which said first and second pins are housed.

[0043] In accordance to this embodiment, said locking plate can be conveniently fixed on one of said first and second lateral arms.

[0044] In a particularly preferred embodiment of the accessory device for a Medium Voltage contactor of the present invention, said latching element comprises at least a further supporting structure for further first and second roller; further first and second pins housed in said further supporting structure onto which said further first and second rollers are respectively mounted free to rotate around a longitudinal axis of said further first and second pins; further first retaining means locking said further first and second pins along the direction of said longitudinal axis; and further second retaining means blocking the rotation of said further first and second pins with respect to said further supporting structure.

[0045] A Medium Voltage contactor comprising an accessory device as disclosed herein is also part of the present invention.

[0046] Further features and advantages of the invention will emerge from the description of preferred, but not exclusive embodiments of the accessory device for a Medium Voltage contactor, according to the invention, non-limiting examples of which are provided in the attached drawings, wherein:

- Figure 1 is a perspective view of an embodiment of the accessory device for a Medium Voltage contactor, according to the invention;
- Figure 2 is a top view of an embodiment of the accessory device for a Medium Voltage contactor, according to the invention;
- Figure 3 is a perspective view of an embodiment of a latching element in the accessory device for a Medium Voltage contactor, according to the invention;
- Figure 4 is a perspective view of a detail of an embodiment of a latching element in the accessory device for a Medium Voltage contactor, according to the invention;
- Figure 5 is an exploded view of a detail of an embodiment of a latching element in the accessory de-

vice for a Medium Voltage contactor, according to the invention.

[0047] With reference to the attached Figures, an accessory device according to the invention, in particular a latching device, is adapted to be used with a Medium Voltage contactor, in a Medium Voltage vacuum contactor.

[0048] According to known embodiments, Medium Voltage contactors normally comprise comprising one or more movable contacts connected through a mechanical link to a contact actuator moving said one or more movable contacts between a contact open position and a contact closed position. Medium Voltage contactors are well known in the art and will not be described in further details.

[0049] The accessory device 1 of the present invention, in its more general definition, comprises a supporting interface 10 which is used for fixing the accessory device 1 on a Medium Voltage contactor, normally on the front side of said Medium Voltage contactor, according to known solutions.

[0050] Then, accessory device 1 comprises a latching element 2 which is movable between a first operating position and a second resting position along an insertion/withdrawal direction. The accessory device 1 further comprises - according to know embodiments - a latching actuating system which moves said latching element 2 between said first, operating, position and said second, resting, position, according to operating principles well known in the art.

[0051] In particular, according to known embodiments, the latching element 2 of the accessory device 1 is adapted - when it is in said first operating position - to cooperate with the mechanical link of a Medium Voltage contactor to latch the movable contacts thereof, and - when it is in said second resting position - to release said movable contacts 101.

[0052] In particular, according to known embodiments, the latching element 2 is intended to be inserted in a space between a movable part of the mechanical link and a fixed part of the Medium Voltage contactor, so as to latch the mechanical link and consequently the contact(s) part of the Medium Voltage contactor in a desired position.

[0053] The general structure and the working principles of an accessory device, in particular of a latching device, for MV contactors are well known in the art and will not be described in further details. In this respect, reference is made to EP 3444830 whose description is incorporated herein by reference.

[0054] During the insertion (and withdrawal) of the latching element 2 into (and from) said space, considerable friction may arise between the latching element 2 and the mechanical link and/or other parts of the Medium Voltage contactor.

[0055] In order to reduce such friction, in a general embodiment of the accessory device 1 of the present invention, the latching element 2 is provided with means 3 for reducing the friction with the mechanical link and/or other parts of said Medium Voltage contactor.

[0056] In particular, said means 3 for reducing the friction, comprise a first 31 and a second 32 roller which are positioned on said latching element 2 so as to interact with the mechanical link and/or other parts of the Medium Voltage contactor during the insertion/withdrawal of the latching element 2 into/from said space of the Medium Voltage contactor.

[0057] As shown in the attached figures, in a general embodiment of the present invention, the latching element 2 comprises a supporting structure 21 for said first 31 and second 32 roller. Then, a first 41 and a second 42 pin are housed in the supporting structure 21. As previously said each of said first 41 and second 42 pins is conveniently made of case-hardened steel so as to be able to withstand the wearing actions during operation.

[0058] On said first 41 and second 42 pin, the first 31 and second 32 roller are respectively mounted in free rotation around the longitudinal axis of said first 41 and second 42 pin, so as to reduce the friction during the insertion/withdrawal of the latching element 2 into/from the latching space of the Medium Voltage contactor.

[0059] Typically, the longitudinal axis of first 41 and second 42 pin, and consequently of the first 31 and second 32 roller, are parallel to each other and are perpendicular to insertion/withdrawal direction of the latching element 2.

[0060] According to a general embodiment of the present invention, the latching element 2 is conveniently provided with first retaining means 5 which lock the first 41 and the second 42 pins along the direction of their longitudinal axis. The latching element 2 is also provided with second retaining means 6 which block the rotation of said first 41 and second 42 pin with respect to the supporting structure 21.

[0061] In particular, as better explained hereinafter, said first retaining means 5 can conveniently comprise first and second locking means which respectively lock the first 41 and second 42 pins along opposite directions along their longitudinal axis.

[0062] With reference to the attached figures, in a particular embodiment of the present invention, the latching element 2 comprises a locking plate 7 which is fixed on the supporting structure 21. Fixing of the plate locking plate 7 on the supporting structure 21 can be made with rivets, screws or other equivalent means.

[0063] With particular reference to figure 5, the locking plate 7 is conveniently provided with a first 61 and a second 62 seat for said first 41 and second 42 pins. As shown in the figures, the first and second seat 61, 62 can be through holes formed in the locking plate 7.

[0064] In such a case, the first 41 and second 42 pins are conveniently provided with a corresponding first 610 and second 620 non-circular shaped end. As the pins have a substantially circular section (i.e. cylindrical shape), the first 610 and second 620 non-circular shaped

end of the pins 41 and 42 can be formed by a cut-out of portion at one end of each of said pins 41 and 42.

[0065] As shown in particular in figure 4, the first 610 and second 620 non-circular shaped end are inserted into the first 61 and second 62 seat of the locking plate 7, so as to mate with their internal surfaces and thereby preventing any rotation of the pins 41 and 42 around their longitudinal axis.

[0066] In this way, the second retaining means 6 which block the rotation of the first 41 and second pin 42 with respect to the supporting structure 21 are formed by the shaped ends 610, 620 of the first 41 and second 42 pins and by their first 61 and second 62 seats formed in the locking plate 7.

[0067] With reference to the attached figures, in a particular embodiment of the present invention, the first 41 and second 42 pins respectively comprise a first 411 and a second 421 raised portion. As shown in the figures, since the pins 41 and 42 have a substantially circular section (i.e. cylindrical shape), the respective raised portions 411 and 412 are conveniently formed by a cylindrical portion of the pins in which the radius of the section is larger than the radius in the other part of the pins.

[0068] According to a preferred embodiment, the first 411 and the second 421 raised portions are adjacent to the first 610 and second 620 non-circular shaped end. In practice, as shown in the attached figures, each of said first 411 and second 421 raised portions has a first face resting on the supporting structure 21 and a further face, which is opposite to said first face, resting on the locking plate 7.

[0069] In practice, with particular reference to figure 2 and referring only to the second pin 42, any displacement of said second pin 42 with respect to the supporting structure 21 along the direction of said longitudinal axis on the left hand side and on the right hand side is avoided by the raised portion 421 of the pin 42 which is blocked between the supporting structure 21 and the locking plate 7. The same situation happens for the first pin 41, whose raised portion 411 is also blocked between the supporting structure 21 and the locking plate 7.

[0070] Thus, with particular reference to figures 1 and 2, in this embodiment the first retaining means 5 which lock said first 41 and second 42 pins along the direction of their longitudinal axis are formed by the raised portions 411 and421 of the pins 41, 42 which rest on and are blocked between the supporting structure 21 and the locking plate 7 of the latching element 2.

[0071] With particular reference to figure 3, in an embodiment of the accessory device 1 for a Medium Voltage contactor of the invention, the supporting structure 21 in the latching element 2 is substantially U-shaped. In particular, the supporting structure 21 is provided with a central base 210, which is fixed on the latching element 2, and a first 211 and a second 212 lateral arms which protrude from opposite sides of said central base 210.

[0072] Then, with particular reference to figure 5, housing holes 250 are provided on said first 211 and second 212 lateral arms, so that said first 41 and second 42 pins can be conveniently housed in said holes 250.

[0073] Moreover, according to this embodiment, the locking plate 7 can be conveniently positioned and fixed on one of the first 211 or second 212 lateral arms of the supporting structure 21 of the latching element 2.

[0074] With reference to figures 1 and 2, in a largely preferred embodiment accessory device 1 for a Medium Voltage contactor of the present invention, the latching element 2 comprises at least a further supporting structure 80 for further first 81 and second 82 roller. The structure and the functioning of this further supporting structure 80 and corresponding rollers 81 and 82 is conveniently identical to the one previously described.

[0075] In practice, as in the previous case, the latching element 2 further comprises further first and second pins which are housed in said further supporting structure 80 and onto which said further first 81 and second 82 rollers are respectively mounted in free rotation around the longitudinal axis of said further first and second pins.

[0076] Moreover, the latching element 2 is also provided with further first retaining means locking said further first and second pins along the direction of said longitudinal axis as well as with further second retaining means blocking the rotation of said further first and second pins with respect to said further supporting structure 80.

[0077] It is clear from the above that the accessory device, in particular the latching device of the present invention allows solving the previously underlined technical problems. Indeed, it has been seen that a latching device according to the present invention, thanks to its structure and to the choice of the material for manufacturing, e.g., the pins, is able to withstand the most severe tests for mechanical endurance.

[0078] Several variations can be made to the accessory device, in particular the latching device for Medium Voltage contactors, and to the Medium Voltage contactor thus conceived, all falling within the scope of the attached claims. In practice, the materials used and the contingent dimensions and shapes can be any, according to requirements and to the state of the art.

Claims

1. An accessory device (1) for a Medium Voltage contactor, in particular a latching device for a Medium Voltage contactor, said Medium Voltage contactor comprising one or more movable contacts connected through a mechanical link to a contact actuator moving said one or more movable contacts between a contact open position and a contact closed position, the accessory device (1) comprising: a supporting interface (10) adapted to be fixed to and removed from said Medium Voltage contactor; a latching element (2) movable between a first operating position and a second resting position along an insertion/withdrawal direction; a latching actuating sys-

tem moving said latching element (2) between said first, operating, position and said second, resting, position; said latching element (2) being adapted, when it is in said first operating position, to cooperate with the mechanical link of said Medium Voltage contactor to latch said one or more movable contacts, and, when it is in said second resting position, to release said one or more movable contacts, said latching element (2) being provided with means (3) for reducing the friction with the mechanical link and/or other parts of said Medium Voltage contactor, **characterized in that** said means (3) for reducing the friction comprise a first (31) and a second (32) roller and **in that** said latching element (2) comprises: a supporting structure (21) for said first (31) and second (32) roller; a first (41) and a second (42) pin housed in said supporting structure (21) onto which said first (31) and second (32) roller are respectively mounted free to rotate around a longitudinal axis of said first (41) and second (42) pin; first retaining means (5) locking said first (41) and second (42) pins along the direction of said longitudinal axis; and second retaining means (6) blocking the rotation of said first (41) and second (42) pin with respect to said supporting structure (21).

2. The accessory device (1) for a Medium Voltage contactor, according to claim 1, **characterized in that** each of said first (41) and second (42) pins is made of case-hardened steel.

3. The accessory device (1) for a Medium Voltage contactor, according to claim 1 or 2, **characterized in that** said first retaining means (5) comprise first and second locking means respectively locking said first (41) and second (42) pins along opposite directions of said longitudinal axis.

4. The accessory device (1) for a Medium Voltage contactor, according to one or more of the previous claims, **characterized in that** said latching element (2) comprises a locking plate (7) fixed on said supporting structure (21).

5. The accessory device (1) for a Medium Voltage contactor, according to claim 4, **characterized in that** said locking plate (7) comprises a first (61) and a second (62) seat for said first (41) and second (42) pins.

6. The accessory device (1) for a Medium Voltage contactor, according to claim 5, **characterized in that** said first (41) and second (42) pins have respectively a first (610) and second (620) non-circular shaped end inserted into and mating with said first (61) and second (62) seat.

7. The accessory device (1) for a Medium Voltage contactor, according to one or more of the previous claims, **characterized in that** said first (41) and second (42) pins respectively comprise a first (411) and a second (421) raised portion.

8. The accessory device (1) for a Medium Voltage contactor, according to claims 6 and 7, **characterized in that** said first (411) and second (421) raised portions are adjacent to said first (610) and second (620) non-circular shaped end.

9. The accessory device (1) for a Medium Voltage contactor, according to claim 8, **characterized in that** each of said first (411) and second (421) raised portions has a first face resting on said supporting structure (21) and a further face, opposite to said first face, resting on said locking plate (7).

10. The accessory device (1) for a Medium Voltage contactor, according to one or more of the previous claims, **characterized in that** said supporting structure (21) is U-shaped with a central base (210) fixed on the latching element (2) and a first (211) and a second (212) lateral arms protruding from opposite sides of said central base (210), housing holes (250) being provided on said lateral arms (211, 212) in which said first (41) and second (42) pins are housed.

11. The accessory device (1) for a Medium Voltage contactor, according to claim 10, **characterized in that** said locking plate (7) is fixed on one of said first (211) and second (212) lateral arms.

12. The accessory device (1) for a Medium Voltage contactor, according to one or more of the previous claims, **characterized in that** the longitudinal axis of said first (41) and second (42) pins are parallel to each other and perpendicular to said insertion/withdrawal direction of the latching element (2).

13. The accessory device (1) for a Medium Voltage contactor, according to one or more of the previous claims, **characterized in that** said latching element (2) comprises at least a further supporting structure (80) for further first (81) and second (82) roller; further first and second pins housed in said further supporting structure (80) onto which said further first (81) and second (82) rollers are respectively mounted free to rotate around a longitudinal axis of said further first and second pins; further first retaining means locking said further first and second pins along the direction of said longitudinal axis; and further second retaining means blocking the rotation of said further first and second pins with respect to said further supporting structure (80).

14. A Medium Voltage contactor comprising an accessory device (1) according to one or more of the pre-

vious claims.

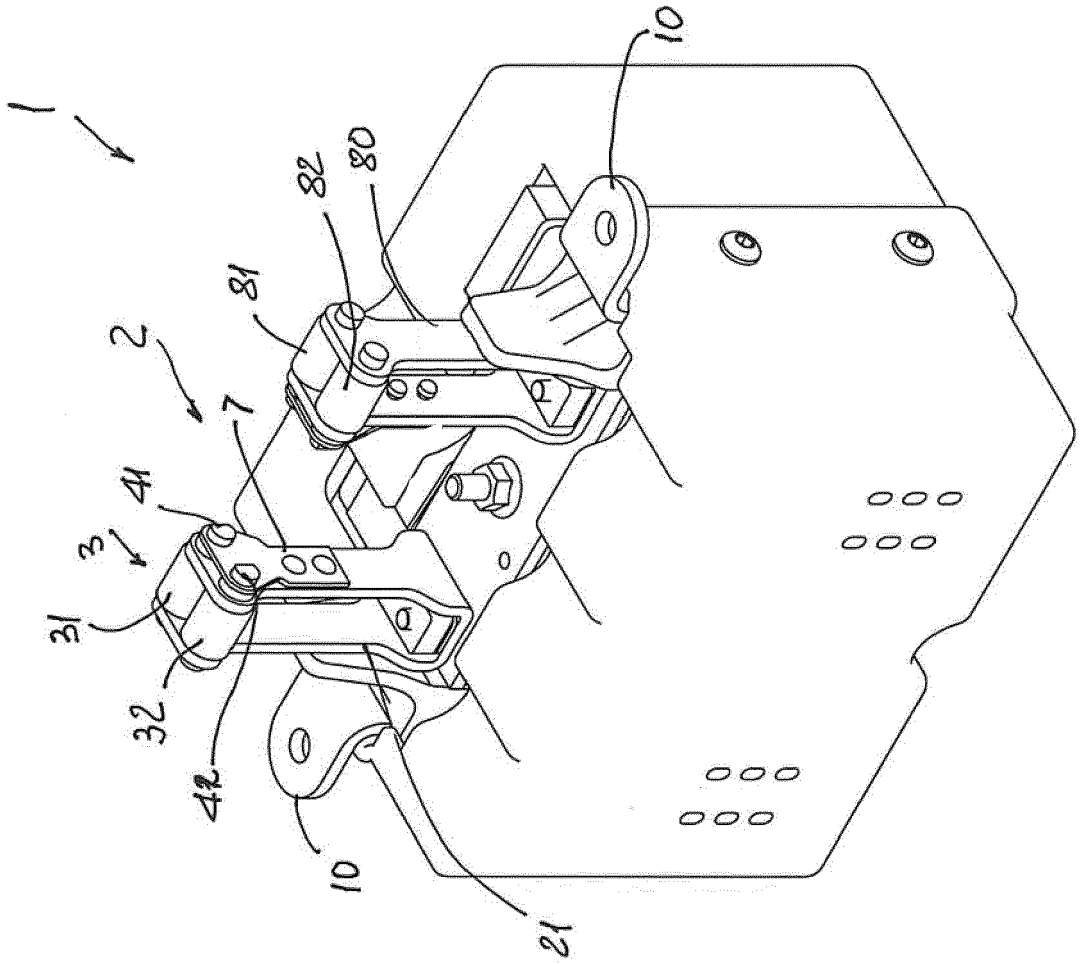

Fig. 1

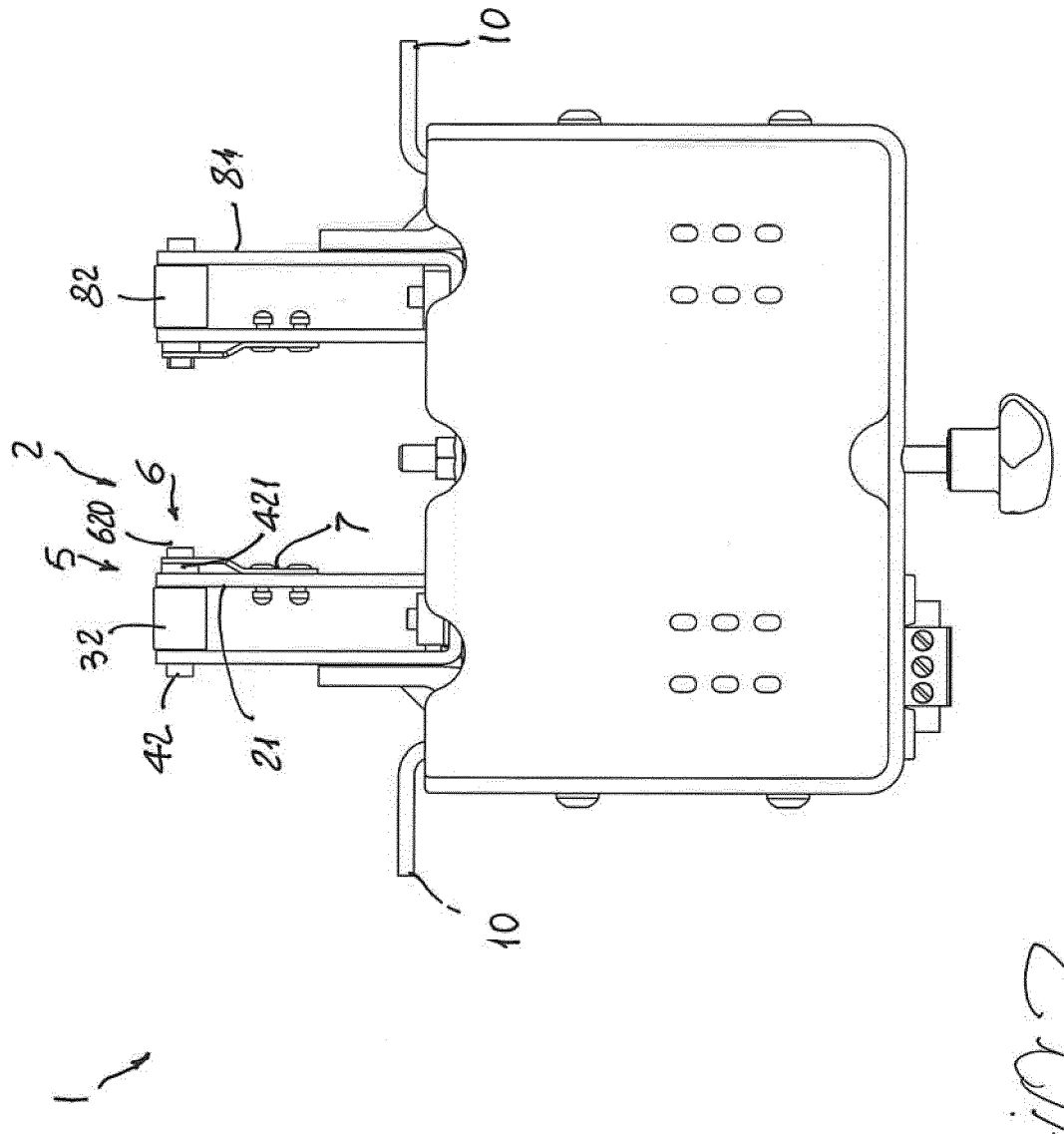

Fig. 2

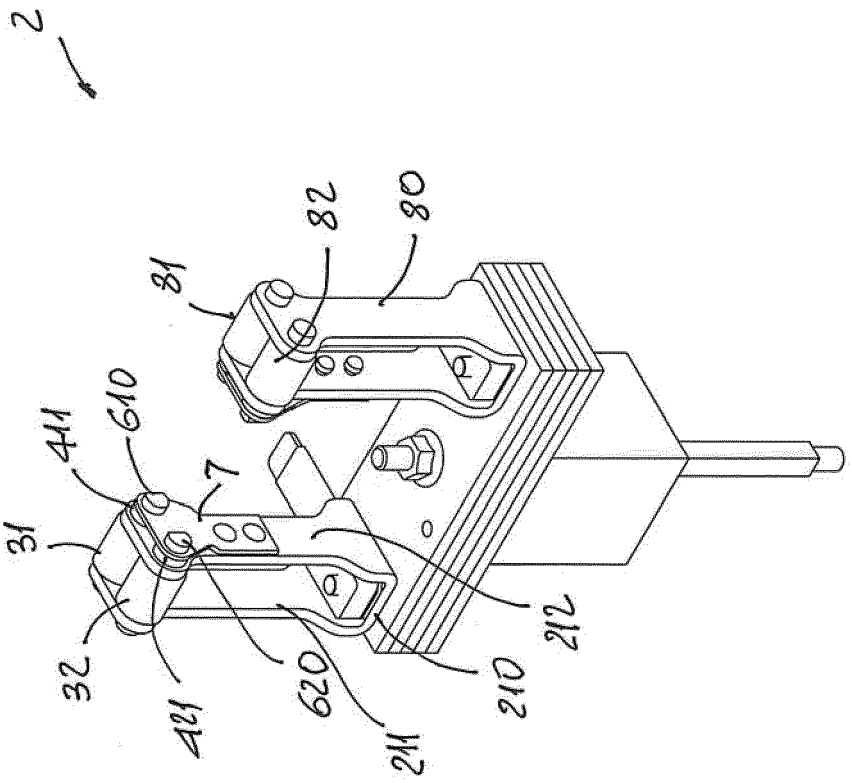

Fig. 3

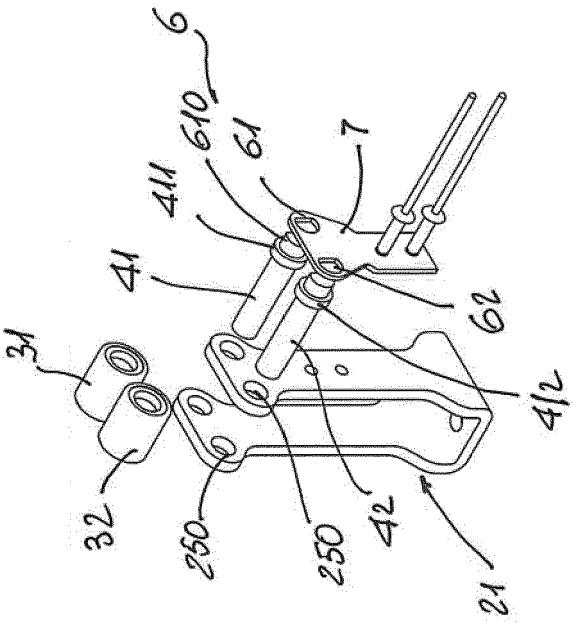
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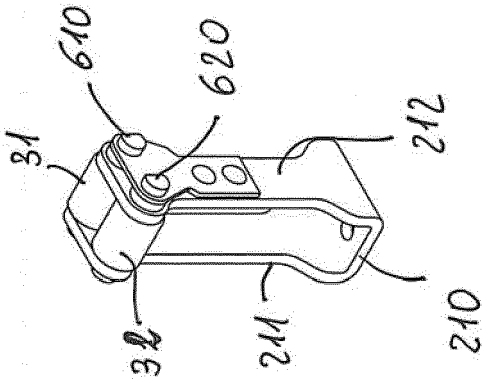
Fig. 5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210

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 19 17 9129

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 November 2019	Dobbs, Harvey

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